

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. - 5. (Canceled)

6. (Currently amended) A computer-implemented method for alternative routing of a connection between a source node and a destination node in a PNNI (Private Network-to-Network Interface) hierarchical network, the method comprising responding to a failed connection between said nodes due to a sole-access element of a network structure as seen by the source node, where a said sole-access element is an element which provides sole access to the destination node in said network structure, by:

examining possible routes closest to the destination node;

selecting using switch control logic to select at least one non-sole-access element of a particular route used by the failed connection in said network structure;

using control logic for identifying an alternative route for the failed connection in said network structure which utilizes said at least one non-sole-access element;

using the control logic for using the alternative route for establishment of the failed connection between said source and destination nodes;

checking whether said alternative route satisfies a set of predefined connection constraints, wherein said alternative route is used for establishment of the connection only if said constraints are satisfied,

wherein said at least one non-sole-access element is a link of said network structure,

wherein the step of selecting comprises selecting from the set of all non-sole-access links elements used by said failed connection which are outside the PNNI peer group of the source node the link which is closest to a predetermined one of the source and destination nodes, and further comprising:

(a) if a successful connection is not established using the alternative route, selecting from said set of non-sole-access links the next closest link to the predetermined node, identifying a new alternative route for said connection which does not utilize said next closest link, and using the new alternative route for establishment of the connection between said nodes; and

(b) repeating step (a) for the new alternative route until all links in said set have been

selected.

7. (Original) A method according to claim 6 including checking whether an identified new alternative route satisfies a set of predefined connection constraints, wherein the identified new alternative route is used for establishment of the connection only if said constraints are satisfied.

8. (Original) A method according to claim 6 wherein said new alternative route does not utilize any link of said set between said predetermined node and said next closest link.

9. (Canceled)

10. (Currently amended) A computer-implemented method for alternative routing of a connection between a source node and a destination node in a PNNI hierarchical network, the method comprising:
 responding to a failed connection in the network between said nodes due to a sole-access element of a network structure as seen by the source node, where a said sole-access element is an element which provides sole access to the destination node in said network structure, by:

 examining possible routes closest to the destination node;

 selecting at least one non-sole-access element of a particular route used by the failed connection in said network structure;

 identifying an alternative route for the failed connection in said network structure which utilizes said at least one non-sole-access element; and

 using the alternative route for establishment of the failed connection between said source and destination nodes;

 checking whether said alternative route satisfies a set of predefined connection constraints, wherein said alternative route is used for establishment of the connection only if said constraints are satisfied[.];

 wherein said at least one non-sole-access element is a link of said network structure,

wherein the step of selecting comprises selecting all non-sole-access links of the route used by said failed connection which are outside the PNNI peer group of the source node, and

wherein, if a successful connection is not established using said alternative route, the method includes:

(a) selecting from the set of all non-sole-access ~~links~~ elements used by said failed connection which are outside the PNNI peer group of the source node the link which is closest to a predetermined one of the source and destination nodes, identifying a new alternative route for the connection which does not utilize said closest link, and using the new alternative route for establishment of the connection between said nodes; and

(b) if a successful connection is not established using the new alternative route, selecting from said set of non-sole-access links the next closest link to the predetermined node, identifying a new alternative route for said connection which does not utilize said next closest link and using the new alternative route so identified for establishment of the connection between said nodes; and

(c) repeating step (b) for the new alternative route so identified until all links in said set have been selected.

11. (original) A method according to claim 10 including checking whether an identified new alternative route satisfies a set of predefined connection constraints, wherein the identified new alternative route is used for establishment of the connection only if said constraints are satisfied.

12. (original) A method according to claim 10 wherein the new alternative route identified in step (b) does not utilize any link of said set between said predetermined node and said next closest link.

13. - 18. (canceled)

19. (Currently amended) Apparatus for alternative routing of a connection between a source node and a destination node in a PNNI hierarchical network, the apparatus comprising:

memory for storing topology data, defining a network structure as seen by the source node, and route data indicative of a particular route in said network structure used for establishment of a connection between the source node and a destination node;

control logic configured to respond to a failed connection between said nodes due to a sole-access element of the network structure as seen by the source node, where a said sole-access element is an element which provides sole access to the destination node in said network structure, by:

examining possible routes closest to the destination node;

selecting at least one non-sole-access element of the route used by the failed connection in accordance with said route data;

identifying from said topology data an alternative route for the failed connection which utilizes said at least one non-sole-access element; and

outputting the alternative route for establishment of the failed connection between said source and destination nodes,

wherein the control logic is configured to check whether the alternative route satisfies a set of predefined connection constraints, and to output the alternative route for establishment of the connection only if said constraints are satisfied,

wherein said at least one sole-access element is a link of said network structure,

wherein the control logic is configured to select from the set of all non-sole-access ~~links~~ elements used by the failed connection which are outside the PNNI peer group of the source node the link which is closest to a predetermined one of the source and destination nodes when performing said selecting step,

wherein the control logic is configured such that:

(a) if a successful connection is not established using the alternative route, the control logic selects from said set of non-sole-access links the next closest link to the predetermined node, identifies a new alternative route for said connection which does not utilize said next closest link, and outputs the new alternative route for establishment of the connection between said nodes; and

(b) the control logic repeats step (a) for the new alternative route until all links in said set have been selected.

20. (original) Apparatus according to claim 19 wherein the control logic is configured to check whether an identified new alternative route satisfies a set of predefined connection constraints, and to output the identified new alternative route for establishment of the connection only if said constraints are satisfied.

21. (original) Apparatus according to claim 19 wherein the new alternative route does not utilize any link of said set between said predetermined node and said next closest link.

22. (canceled)

23. (Currently amended) Apparatus for alternative routing of a connection between a source node and a destination node in a PNNI hierarchical network, the apparatus comprising:
memory for storing topology data, defining a network structure as seen by the source node, and route data indicative of a particular route in said network structure used for establishment of a connection between the source node and a destination node;

control logic configured to respond to a failed connection between said nodes due to a sole-access element of the network structure as seen by the source node, where a said sole-access element is an element which provides sole access to the destination node in said network structure, by:

- examining possible routes closest to the destination node;
- selecting at least one non-sole-access element of the route used by the failed connection in accordance with said route data;
- identifying from said topology data an alternative route for the failed connection which utilizes said at least one non-sole-access element; and
- outputting the alternative route for establishment of the failed connection between said source and destination nodes,

wherein the control logic is configured to check whether the alternative route satisfies a set of predefined connection constraints, and to output the alternative route for establishment of the connection only if said constraints are satisfied.

wherein said at least one sole-access element is a link of said network structure.

wherein the control logic is configured to select all non-sole-access links of the route used by said failed connection which are outside the PNNI peer group of the source node when performing said selecting step,

wherein the control logic is configured such that, if a successful connection is not established using said alternative route:

- (a) the control logic selects from the set of all non-sole-access ~~links~~ elements used by said failed connection which are outside the PNNI peer group of the source node the link which is closest to a predetermined one of the source and destination nodes, identifies a new alternative route for the connection which does not utilize said closest link, and outputs the new alternative route for establishment of the connection between said nodes; and

(b) if a successful connection is not established using the new alternative route, the control logic selects from said set of non-sole-access links the next closest link to the predetermined node, identifies a new alternative route for said connection which does not utilize said next closest link, and outputs the new alternative route so identified for establishment of the connection between said nodes; and

(c) the control logic repeats step (b) for the new alternative route so identified until all links in said set have been selected.

24. (original) Apparatus according to claim 23 wherein the control logic is configured to check whether an identified new alternative route satisfies a set of predefined connection constraints, and to output the identified new alternative route for establishment of the connection only if said constraints are satisfied.

25. (original) Apparatus according to claim 23 wherein the new alternative route identified in step (b) does not utilize any link of said set between said predetermined node and said next closest link.

26. - 31. (canceled)